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(71) Applicant

John Frederick Blake

Brackendale

Bromeswell

Woodbridge

Suffolk

(72) Inventor

John Frederick Blake

(74) Agents

Graham Watt & Co

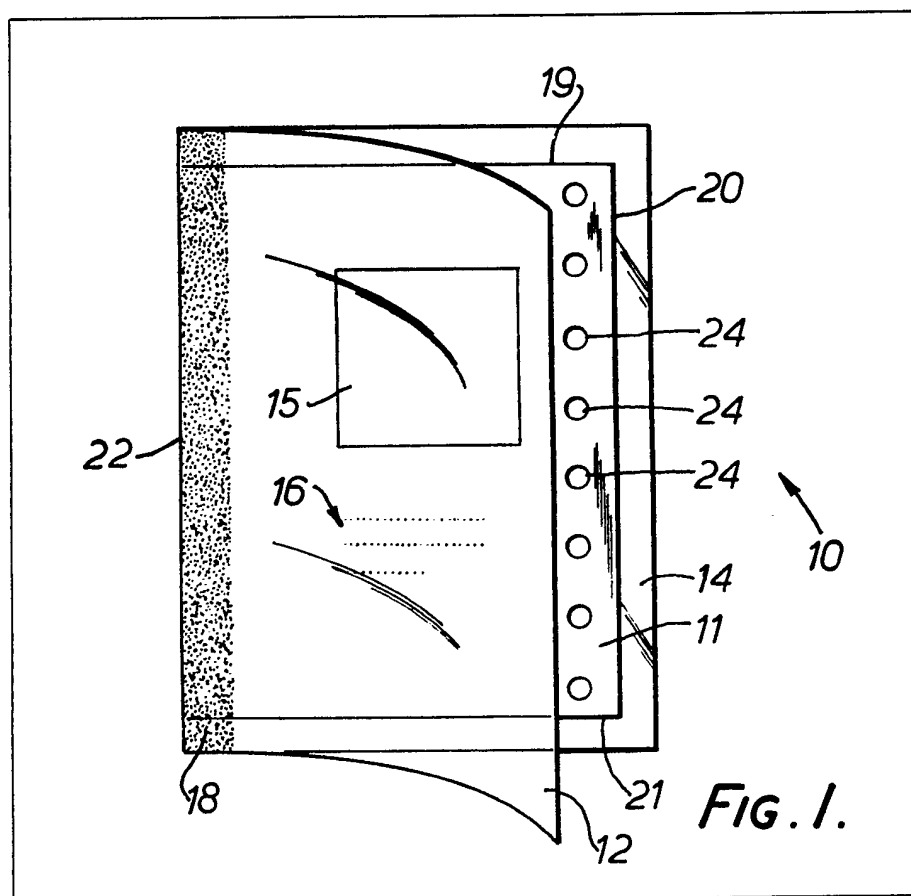
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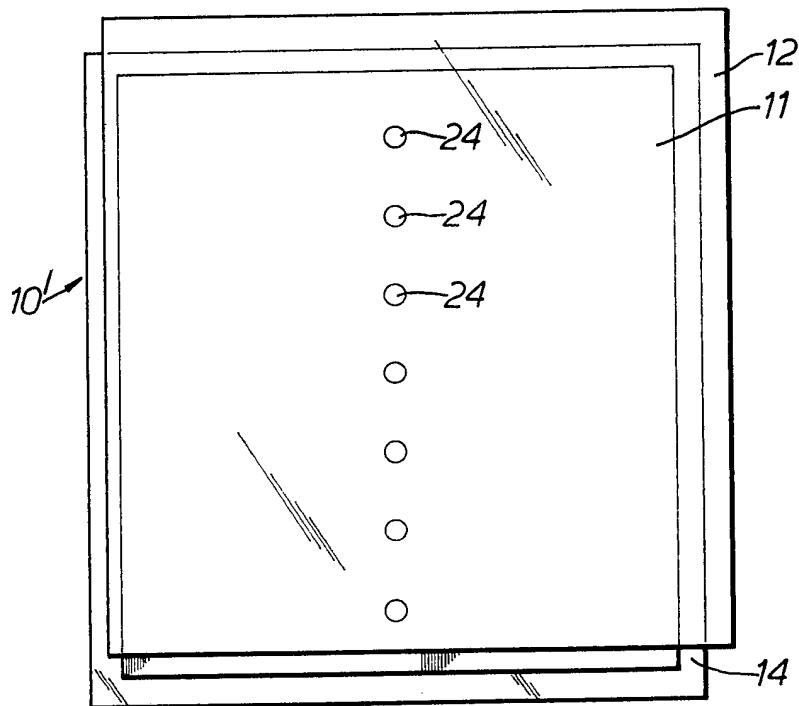
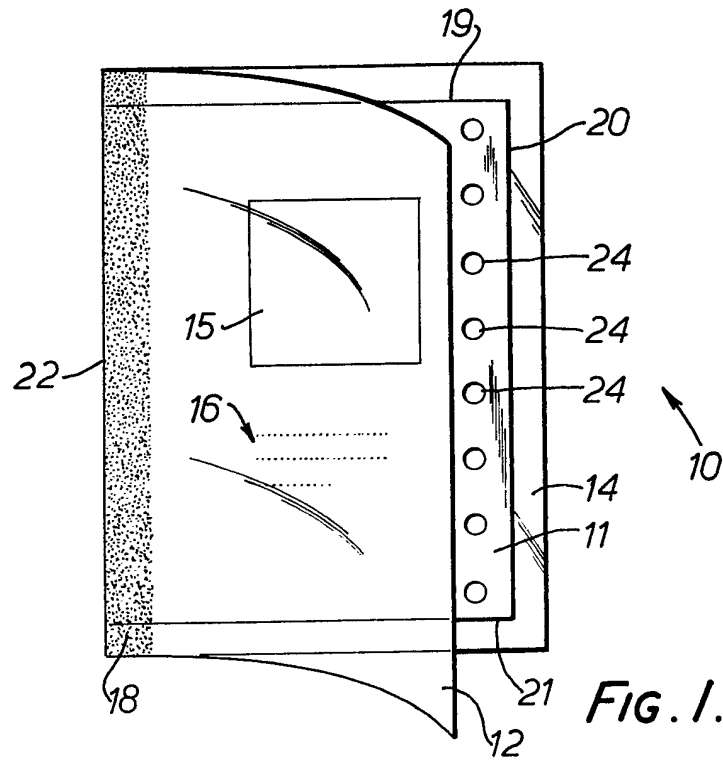
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(54) Tamperproof security passes

(57) A security pass (10), for instance the photograph page of a passport, comprises a record sheet (11) united (along 18) to two embracing transparent thermoplastics oversheets (12, 14). The record sheet (11) to which the photograph and/or specific verbal data is applied (at 15, 16) is made of thermoplastics material or paper impregnated with particles of such material. Having recorded the data, the record sheet is interfacially bonded with the oversheets by fusing the thermoplastics of sheets (11, 12 and 14) to each other. Fusible sewing thread is advantageously used to unite the pass (10) with the other passport pages, after sewing the thread being fused at thread crossing points and to the pass (10).



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## SPECIFICATION

### Tamperproof security passes

5 The present invention relates to tamperproof security passes.  
 10 By "security passes" is meant such articles as security badges, identification cards, licences and passports, as well as any other article or document which it is intended shall exhibit recorded data needing to be safeguarded against unlawful alteration.

15 According to the present invention there is provided a security pass comprising a sheet for recording on at least one face thereof data to be rendered tamperproof, the sheet being impregnated with particles of a thermoplastics material, or consisting of such material, and at least one oversheet for covering data recorded on the record sheet, the or each oversheet comprising a thermoplastics film compatible with the thermoplastics of the record sheet and weldable to a face of the record sheet by application of heat energy to the sheet assembly. The security against tampering obtained by bonding the record sheet to the or each oversheet will readily be appreciated.

25 The pass can be a sandwich assembly of the record sheet between two oversheets.  
 30 In a preferred embodiment, the oversheets are each fused to a respective face of the record sheet and the oversheets overlap one, some or all of the edges of the record sheet, marginal portions of the oversheets extending beyond the record sheet being fused one to the other.

35 Advantageously, for maximum security, the record sheet has apertures therein enabling the oversheets to be fused one to the other through the apertures. Fusion of the oversheets to one another through such apertures can optionally be coupled with fusion of the marginal portions thereof along some or all of the record sheet edges.

40 Documents, such as bank and building society pass books, and passports may incorporate a pass incorporating the invention. In a passport, for instance, the citizen's photograph will be borne on the record sheet together with the expiry date and other information which the authorities may wish to protect against alteration. The pass may be sewn into the document using a thread containing a thermoplastics element which is fused for instance to the pass, to guard against unauthorised substitution by another pass.

45 The invention will now be described in more detail by way of example only, with reference to the accompanying drawing, in which:  
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*Figure 1* illustrates a security pass according to the invention in a form adapted for binding into a book such as a passport, and

55 *Figure 2* illustrates in exploded form another security pass according to the invention.

Uses to which this invention can be put include licences, employee identification badges and general identification cards. The configuration of embodiments of the invention will, therefore, depend on the application.

70 One application, suited for binding into documents such as pass books and passports, is shown in Fig. 1. The pass 10 comprises an inner record sheet 11 sandwiched between facing oversheets 12, 14 of transparent thermoplastics material, for instance PVC film. The record sheet 11 is made of paper impregnated with particles of thermoplastics material compatible with and fusible to the oversheets 12, 14. The particles can be in the form of granules or fibres for instance of PVC. For passports, a photograph of the citizen will be attached to the record sheet at 15, and stamped or printed data individual to the citizen or his passport will be applied for instance at 16.

The sheets 11, 12 and 14 are united as by fusing along one margin or edge 18, ready for binding into the document.

90 In use, after recording the specific data to be protected from alteration on the record sheet 11 at 15, 16 and on one or both sides thereof, the three sheets are pressed together between platens and caused to fuse to one another. The platens can be part of a high frequency welder. This will be adjusted as to pressure, dwell time, power frequency according to the user's experience of his equipment. Other heat bonding equipment can be used, depending on the nature of the thermoplastics materials, and can include ultrasonic bonding machines, heat sealers and impulse sealers.

100 Since interfacial bonds are formed between sheets 12 and 11, and 11 and 14, all the sheets can be of the same size. It may be preferred, however, for the record sheet to be smaller than the oversheets 12, 14 so that the latter overlap at least one edge of the record sheet 11. In the illustrated example, oversheets 12, 14 overlap or extend beyond three adjacent edges 19, 20, 21 of the record sheet 11. The fourth edge 22 is aligned with the corresponding edges of oversheets 12, 14. With this arrangement, the oversheets 115 12, 14 will be fused one to the other where they border the edges 19, 20 and 21.

For even greater security, the record sheet can be perforated at intervals, allowing the oversheets to fuse directly to each other through the perforations. The line of perforations 24 is but one example of the way in which the perforations can be disposed. In another example, the perforations may enclose an area within which a photograph is mounted. Fusing through perforations in the record sheet 11 can, if desired, be used as an addition or alternative to fusing marginal portions of the sheets 12, 14 bordering some or all the sides of the record sheet.

120 The construction shown in Fig. 1 affords

protection of recorded data on either or both of the surfaces of record sheet 11. If data is recorded only on the top surface of sheet 11, it may suffice to utilise only the one oversheet

5 12.

Another physical arrangement 10' is shown in Fig. 2, where the record sheet and oversheets are numbered as before, and can consist of the same materials. In this arrangement, oversheets 12, 14 are again larger than the record sheet 11 which is centered with respect thereto. When the sheets have been assembled with sheet 11 sandwiched between the oversheets, the oversheets will be bonded to themselves, through the row of apertures 24 and around all four edges of the record sheet 11.

As described above, the record sheet 11 is plastics impregnated paper. It could, however, be an opaque thermoplastics film so long as it is able to receive printing without smearing, and is compatible with the oversheet(s) so as to be fusible therewith.

A security pass as described, and for instance as shown in Fig. 1, can be bound with other pages into a document or book such as a passport using techniques the subject of copending U.K. patent application No. 8027871 to which attention is hereby directed. A certified copy of this application will be found on the official Patent Office file of the present application.

Accordingly, the pass 10 or 10' is assembled with the other pages of the book and overlock sewn with one or two threads which comprise natural or synthetic filaments (e.g. silk and nylon) combined with one or more thermoplastics elements. The thermoplastics elements can comprise filaments combined with the other or core filaments, or a unitary sheath around the core filaments. After sewing in the conventional manner, the sewn area alone is subjected to a fusing operation using equipment as disclosed above. This operation serves to fuse the thread crossing points. Such thread fusing defeats attempts to unpick the sewn seam. Where the pass 10 or 10' is located in the centre of the page section, the fusing operation also fuses the thread to the pass. Attempts to remove the pass undetectably will thus be foiled.

During the binding process, fusing is confined to the sewn area, to avoid fusing sheet 11 to the oversheet(s). (It is normal for specific data to be recorded on sheet 11 after the book has been bound and covered or cased).

Covering or casing of the book is performed either simultaneously with sewing the book pages together, or subsequently. This part of the process is capable of execution conventionally and thus will not be described here.

To help defeat attempts to remove pages, the pages with which the pass 10 or 10' is assembled may be made of thermoplastics material. Alternatively, they may be paper

impregnated with thermoplastics particles. Then, in the course of thread fusing it will be feasible to fuse all the pages together adjacent the sew line.

70 Advantageously, data is recorded by printing on the sheet 11 using a fugitive ink incorporating a thermoplastics material dispersed therein. If this thermoplastics material is compatible, or fusible, with the plastics of the record sheet and the associated oversheet(s), added protection against erasure and alteration is obtained.

It will be appreciated that the record sheet 11 must accept written, printed or stamped data without smudging. So long as this is possible, the record sheet 11 could be made wholly of thermoplastics material rather than plastics-impregnated paper.

## 85 CLAIMS

1. A security pass comprising a sheet for recording on at least one face thereof data to be rendered tamperproof, the sheet being impregnated with particles of a thermoplastics material, or consisting of such material, and at least one oversheet for covering data recorded on the record sheet, the or each oversheet comprising a thermoplastics film compatible with the thermoplastics of the record sheet and weldable to a face of the record sheet by application of heat energy to the sheet assembly.

2. A security pass according to claim 1, which comprises a sandwich assembly of the record sheet between two oversheets.

3. A security pass according to claim 2, wherein the oversheets are each fused to a respective face of the record sheet and the oversheets overlap one, some or all of the edges of the record sheet, marginal portions of the oversheets extending beyond the record sheet being fused one to the other.

4. A security pass according to claim 2 or claim 3, wherein the record sheet has apertures therein enabling the oversheets to be fused one to the other through the apertures.

5. A security pass according to claim 1, 2 or 4, wherein the record sheet and the or each oversheet are united along one edge of the record sheet in readiness for binding into a book.

6. A security pass according to any of claims 1 to 5, wherein the said thermoplastics of the record sheet comprises polyvinyl chloride.

7. A security pass substantially as herein described with reference to and as shown in Fig. 1 or Fig. 2 of the accompanying drawings.

8. A book, for example a passport, containing a security pass as claimed in any of claims 1 to 7, wherein the security pass is bound to other pages of the book by threads, including one or more thermoplastics elements, which are fused together at thread-

crossing points and at least to the security pass.

9. A book according to claim 8, wherein the threads comprise a core of nylon or silk covered by a polyvinyl chloride sheath.

10. A book according to claim 8 or claim 9, wherein the said other pages are thermoplastics material, or are impregnated by particles of thermoplastics material, compatible with at least the thermoplastics of the threads, and are bonded to themselves and the threads adjacent the sew line.

11. A security pass according to any of claims 1 to 7 or a book according to claim 8, 9 or 10, wherein said pass has data recorded thereon in a fugitive ink which incorporates a thermoplastics component compatible with the thermoplastics of the record sheet and the or each oversheet, the or each oversheet being fused both to the record sheet and to the data thereon.

12. A passport or similar tamperproof document, substantially as herein described with reference to the accompanying drawings.

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